

CLAIMS

What is claimed is:

1. A computer model for describing a performance of a segmented transmission line having a plurality of segments, each segment having a transfer function, comprising:
- 5 (a) means for storing at least one characteristic value the transfer function of a respective segment of the segmented transmission line;
- (b) means for storing information relating to at least one algorithm, said algorithm being for determining the effect of a respective characteristic value and sequence of transmission line segments on a performance of the overall segmented transmission line; and
- 10 (c) means for adjusting a characteristic value, whereby a set of characteristic values may be defined for respective transmission line segments, having an optimized performance in view of the at least one algorithm.
- 15 2. The model according to claim 1, wherein the characteristic value is a length of a respective transmission line segment.
- 20 3. The model according to claim 1, wherein the at least one algorithm calculates a transfer function of the segmented transmission line.
4. The model according to claim 1, wherein the adjusting means allows adjustment of all characteristic values, the adjustments being based on a determined performance of the segmented transmission line.

5. The model according to claim 1, wherein the segmented transmission line comprises an air-spaced coaxial transmission line adapted for transmitting an RF signal, the performance comprising signal transmission efficiency.

5 6. The model according to claim 1, wherein a precision of the algorithm exceeds a manufacturing tolerance of the segmented transmission line.

10 7. The model according to claim 1, further comprising means for outputting a predicted performance of the segmented transmission line based on the respective characteristic values.

15 8. The model according to claim 1, wherein the respective characteristic values are substantially non-incrementally distributed across a range.

20 9. The model according to claim 1, wherein the respective characteristic values are substantially non-monotonically distributed across a range.

10. A method for optimizing the segment characteristics of a segmented transmission line, comprising the steps of modeling the electrical performance of the segmented transmission line, evaluating the model for electrical performance, and selecting a set of segment characteristics, based on the evaluation, which meets a set of predefined optimization criteria.

11. The method according to claim 10, wherein the set of segment characteristics comprises a respective length of each segment.
12. The method according to claim 10, wherein the model is evaluated to determine a transfer function of the segmented transmission line.
13. The method according to claim 10, wherein the segmented transmission line comprises an air-spaced coaxial transmission line adapted for transmitting an RF signal, the predefined optimization criteria comprising signal transmission efficiency.
14. The method according to claim 10, wherein a precision of the evaluation exceeds a manufacturing tolerance of the segmented transmission line.
15. The method according to claim 10, further comprising outputting a predicted performance of the segmented transmission line based on the respective segment characteristics.
16. The method according to claim 10, further comprising the step of producing a set of transmission line segments according to the selected segment characteristics.
- 20 17. The method according to claim 10, wherein a variation in respective segment characteristics is distributed substantially non-incrementally.

18. The method according to claim 10, wherein a variation in respective segment

~~characteristics is distributed substantially non-monotonically.~~

sh 3

19. A segmented transmission line, produced according to claim 16, wherein the
5 segment characteristic comprises a respective segment length and the optimization criteria
comprises a minimization of worst case VSWR over a radio frequency band.

20. A segmented transmission line, produced according to claim 16, wherein the
segmented transmission line comprises an air-spaced coaxial transmission line adapted for
transmitting an RF signal; the segment characteristic comprises a respective segment length; and
the optimization criteria comprises a minimization of worst case VSWR over a radio frequency
band.

add
A2